

## ABSTRACT

*Graph implementation is widely use in various sector such as automotive, traffic, image processing and many more. Usually it produce graph in very large dimension, so in that processing, require supercomputer to solve. On this research the processing of the graph is to searching the shortest path between two vertex with Breadth-First Search algorithm, with given problem single destination shortest path. Searching path on graph is implemented on Inspur cluster supercomputer on High Performance Computing laboratory Computational Science, Telkom University. The graph data form used in this reasearch is adjacency list with data type directed and unweighted. Reasearch tested with graph data in many size and analyze based on speed up and time execution. The result show that performance of the inspur cluster supercomputer can solve given data problem up to 90 times faster in parallel than serial on execution with 96 threads.*

**Keywords :** *Graph, BFS, Shortest Path, Inspur, Parallel*